AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A signal measurement system comprising:

an acquisition memory; and

a pulse management system configured to automatically perform a series of pulse measurements on a time-varying analog signal comprising a plurality of pulses, samples of which are stored in the acquisition memory during a single acquisition of the time-varying analog signal, wherein the pulse management system generates and stores in a searchable data structure pulse characteristics comprising results of pulse measurements taken of each of the plurality of pulses, and pulse measurement statistics comprising the results of statistical analyses of at least one of said pulse measurements, and wherein said pulse characteristics are stored in a signal pulse characteristic data unit comprising ~~comprises~~ a pulse identifier data unit uniquely identifying each of said plurality of pulses ~~each said pulse~~ of said acquired signal, and a plurality of pulse measurement results data units associated with each said pulse identifier.

2. (Previously Presented) The signal measurement system of claim 1, wherein said signal measurement system comprises an oscilloscope.

3. (Currently Amended) The signal measurement system of claim 1, wherein said pulse management system is constructed and arranged to perform said series of pulse measurements on said time-varying analog ~~previously acquired~~ signal automatically and without operator involvement.

4. (Currently Amended) The signal measurement system of claim 1, wherein said pulse management system comprises:

a histogrammer that samples the acquired signal to generate at least one histogram, said histogram comprising a distribution of a number ~~of number~~ of occurrences that said acquired signal attained each of a plurality of signal levels over a specified time range; and

a mode finder that identifies one or more modes of said histogram representing one or more signal levels that occur most frequently in said histogram, each of said one or more modes representing a signal level having a logical interpretation.

5. (Previously Presented) The signal measurement system of claim 4, wherein said pulse management system further comprises:

a transition calculator that determines a transition signal level at each of one or more transition percentages, wherein each of said one or more transition percentages is a percentage of a difference between two of said signal levels having a logical interpretation.

6. (Previously Presented) The signal measurement system of claim 5, wherein said pulse management system further comprises:

a data analyzer that processes said acquisition signal sample data to determine transition times at which each of said plurality of pulses attains each of said transition signal levels.

7. (Previously Presented) The signal measurement system of claim 6, wherein said pulse management system further comprises:

a pulse measurement engine that performs said plurality of pulse measurements on each said plurality of pulses utilizing said transition times and an indication of a type of pulse.

8. (Previously Presented) The signal measurement system of claim 6, wherein said plurality of pulse measurements are predetermined.

9. (Previously Presented) The signal measurement system of claim 1, wherein said statistical analyses comprise one or more of the group consisting of:

maximum, minimum, mean, mode, median, and standard deviation.

10. (Currently Amended) The signal measurement system of claim [[6]] 4, wherein ~~said~~ measurement parameters are provided ~~by the~~ by an operator, and wherein the pulse characteristics are generated in accordance with said measurement parameters.

11. (Currently Amended) The signal measurement system of claim 3, wherein said pulse management system further comprises:

a transition calculator that determines the signal level at specified transition percentages ~~each specified transition percentage~~ based on one or more signal levels for each logical state of the plurality of pulses in the acquired signal including at least a top signal level and base signal level, wherein said one or more signal levels are provided by the operator.

12. (Currently Amended) The signal measurement system of claim 4, wherein said histogram comprises a table stored in memory that lists a quantity ~~the quantity~~ of sampled occurrences said acquired signal attained each of a plurality of signal level values ~~level value~~ over a certain time range.

13. (Previously Presented) The signal measurement system of claim 12, wherein said acquired signal is a voltage signal, and wherein said signal levels represented in said histogram are voltage levels.

14. (Previously Presented) The signal measurement system of claim 4, wherein an acquisition memory stores acquisition data pertaining to a plurality of acquired signals, and wherein said measurement parameters includes a source indication that indicates which of said plurality of acquired signals is to be processed by said histogrammer.

15. (Previously Presented) The signal measurement system of claim 4, wherein said acquired signal comprises two signal levels having a logical interpretation, and wherein said histogram is nominally a bimodal signal level distribution.

16. (Currently Amended) The signal measurement system of claim [[4]] 10, wherein said measurement parameters includes an indication of the number of signal levels of said acquired signals which have a logical representation, wherein said mode finder utilizes said indication to identify a number of modes of said histogram.

17. (Previously Presented) The signal measurement system of claim 4, wherein said acquired signal is an alternate mark inversion communication signal that transitions between three signal values, and wherein said mode finder identifies three modes in said histogram.

18. (Previously Presented) The signal measurement system of claim 4, wherein said mode finder implements a smoothing function to identify any of said one or more modes of said histogram that is not well defined.

19. (Previously Presented) The signal measurement system of claim 5, wherein said signal levels having a logical interpretation include a top signal level and a base signal level, and wherein said transition calculator determines transition signal levels achieved by each pulse at said transition percentages of the signal transitions between said top and base signal levels.

20. (Previously Presented) The signal measurement system of claim 19, wherein said transitional percentages comprise 10%, 50% and 90% of the difference between said top signal level and said base signal level.

21. (Previously Presented) The signal measurement system of claim 19, wherein said transition percentages are provided by the operator through a user interface.

22. (Currently Amended) The signal measurement system of claim 1, wherein said pulse management system comprises:

a transition calculator that determines the signal level at each specified transition percentage based on one or more signal levels for each logical state of the plurality of pulses ~~the pulse~~ in the acquired signal including at least a top signal level and base signal level, wherein said one or more signal levels are provided by the operator.

23. (Previously Presented) The signal measurement system of claim 7, wherein said pulse measurements comprise one or more of the group consisting of rise time; fall time; pulse width; preshoot; pulse area; minimum voltage; maximum voltage; average voltage; volts AC RMS; volts DC RMS; amplitude voltage; base voltage; top voltage; upper voltage; middle voltage; lower voltage; plus width; minus width; positive duty cycle; negative duty cycle; period; phase; frequency; delta time; peak-to-peak voltage; and overshoot.

24. (Previously Presented) The signal measurement system of claim 1, wherein said signal measurement system is a digital oscilloscope.

25. (Currently Amended) A signal measurement system comprising:

an acquisition memory; and

pulse management means for automatically performing a series of pulse measurements on a time-varying analog signal comprising a plurality of pulses, samples of which are stored in the acquisition memory during a single acquisition of the time-varying analog signal, and for generating for storage in a searchable data structure pulse characteristics of each of the plurality of pulses, wherein for each of the plurality of pulses, said pulse characteristics comprise results of pulse measurements taken of each of the plurality of pulses, and pulse measurement statistics comprising the results of statistical analyses of at least one of said pulse measurements, and wherein said pulse characteristics are stored in a signal pulse characteristic data unit comprising ~~comprises~~ a pulse identifier data unit uniquely identifying each of said plurality of pulses ~~each said pulse~~ of said acquired signal, and a plurality of pulse measurement results data units associated with each said pulse identifier.

26. (Previously Presented) The signal measurement system of claim 25, wherein said pulse management means comprises:

means for generating at least one histogram of said acquired signal; and

means for identifying one or more modes of said histogram.

27. (Previously Presented) The signal measurement system of claim 26, wherein said pulse management means further comprises:

means for determining a transition signal level at each of one or more transition percentages, wherein each of said one or more transition percentages is a percentage of a difference between two of said signal levels having a logical interpretation.

28. (Previously Presented) The signal measurement system of claim 27, wherein said pulse management means further comprises:

means for determining transition times at which each pulse attains each of said transition signal levels.

29. (Previously Presented) The signal measurement system of claim 28, wherein said pulse management means further comprises:

means for performing said plurality of pulse measurements on each of said plurality of pulses utilizing said transition times and an indication of a type of pulse.

30 - 43 (Canceled)

44. (Currently Amended) A method for generating a searchable pulse data structure for storage in a memory apparatus operationally coupled to a signal measurement system, said data structure comprising a plurality of signal pulse characteristics of pulses of time-varying analog signal samples of which are stored in an acquisition memory of the signal measurement system during a single acquisition of the time-varying analog signal, the method comprising the steps of:

1) automatically performing a plurality of pulse measurements on the signal; and

2) generating for storage in a searchable data structure pulse characteristics of each of the plurality of pulses, wherein for each of the plurality of pulses, said pulse characteristics comprise results of pulse measurements taken of each of the plurality of pulses, and global pulse measurement statistics comprising the results of statistical analyses of at least one of said pulse measurement, and wherein said pulse characteristics are stored in a signal pulse characteristic data unit comprising ~~comprises~~ a pulse identifier data unit uniquely identifying each of said plurality of pulses ~~each said pulse~~ of said acquired signal, and a plurality of pulse measurement results data units associated with each said pulse identifier.

45. (Currently Amended) The method of claim 44, further comprising the steps of:

3) receiving, before said step 1), an indication of a type ~~the type~~ of pulse train embodied in the acquisition signal;

4) determining, before said step 1), transition signal levels at one or more transition percentages

5) determining, before said step 1), transition times each of said plurality of pulses ~~each said pulse~~ of said acquired signal attains each of said transition signal levels.

46. (Original) The method of claim 45, wherein said step 4) comprises the steps of:

a) receiving one or more transition percentages;

b) generating at least one histogram of said acquisition data;

c) determining top, base and other voltage levels based on modes of said histogram and said pulse train type; and

d) calculating transition voltages at each of said transition percentages relative to the top and base voltages for said pulse train type.

47. (Original) The method of claim 45, wherein said step 4) comprises the steps of:

a) receiving one or more transition percentages;

b) receiving global top and base voltages; and

c) calculating transition voltages at each of said transition percentages relative to the top and base voltages for said pulse train type.

48. (Currently Amended) The method of claim 45, wherein said step 4) comprises the step of:

a) receiving global transition signal levels at said one or more transition percentages between a top signal level and a base ~~said top signal level and said base~~ signal level.

49. (Previously Presented) The method of claim 44, wherein said signal measurement system includes a plurality of channels or an acquisition memory sufficiently large to store data captured during more than one acquisition, and wherein the method further comprises the step of:

3) receiving an indication of which of said plurality of channels is to be a source of said acquisition data in the single data acquisition.

50. (Canceled)

51. (Currently Amended) The method of claim 45, wherein said pulse train type is provided by an operator ~~the operator~~.

52. (Canceled)

53. (Previously Presented) The method of claim 44, wherein said signal pulse characteristics further comprise:

a time of occurrence data unit associated with each pulse identifier data unit in said searchable data structure, each said time of occurrence data unit indicating a time said associated pulse occurred relative to a time at which a trigger event causing said storage of said acquired signal occurred.

54. (Previously Presented) The method of claim 53, wherein said data structure further comprises:

global measurement statistics data units for one or more of said plurality of pulse measurements, wherein said global measurement statistics are associated with said acquired signal in said data structure.

55. (Previously Presented) The method of claim 44, wherein said pulse identifier data unit is a value indicating a relative occurrence of said associated pulse relative to other pulses of said acquired signal.

56. (Previously Presented) The method of claim 54,

wherein said acquired signal is one of a plurality of acquired signals, the acquisition data for each of which is stored in an acquisition memory,

wherein said searchable data structure includes said pulse characteristics data units and said global measurement statistics data units for a plurality of acquired signals,

wherein each such pulse characteristics data units and global measurement statistics data units are associated with said unique identifier of said acquisition.

57. (Previously Presented) The method of claim 44, wherein said data structure has a data format suitable for an implementing application.

58. (Previously Presented) The method of claim 53, wherein said pulse characteristics further comprise:

a pulse type data unit associated with each of said plurality of pulse identifier data units, said pulse type data unit indicting whether said corresponding signal pulse is a positive or negative pulse.

59. (Previously Presented) The method of claim 53, wherein each of said plurality of pulse measurement results data units associated with each of said plurality of pulse identifier data units in said data structure comprise one or more of the group consisting of:

rise time measurement results;
fall time measurement results;
pulse width measurement results;
preshoot measurement results;
pulse area measurement results;
minimum voltage measurement results;
maximum voltage measurement results;
average voltage measurement results;
volts AC RMS measurement results;
volts DC RMS measurement results;
amplitude voltage measurement results;
base voltage measurement results;
top voltage measurement results;
upper voltage measurement results;
middle voltage measurement results;
lower voltage measurement results;
plus width measurement results;
minus width measurement results;
positive duty cycle measurement results;
negative duty cycle measurement results;
period measurement results;
phase measurement results;
frequency measurement results;
delta time measurement results;
peak-to-peak voltage measurement results;
and overshoot measurement results.

60. (Currently Amended) The method of claim [[52]] 44, wherein said plurality of pulse identifier data units and said associated pulse characteristic data units are arranged in said data structure in a same sequence as said corresponding signal pulses occur.

61. (Previously Presented) The method of claim 44, wherein said pulse characteristic data units and said pulse identifier data units are stored in said pulse data structure automatically and with no operator involvement.

62. (Previously Presented) The method of claim 44, wherein said data structure is populated automatically and in accordance with measurement parameters.

63. (Currently Amended) The method of claim 62, wherein said measurement parameters are provided at least in part by an operator ~~the operator~~ through a user interface operatively coupled to the signal measurement system.

64. (Previously Presented) The method of claim 44, wherein said data structure is generated and populated by said pulse characteristics in response to an acquisition memory storing said acquired signal.

65. (Previously Presented) The method of claim 44, wherein said signal measurement system is a digital oscilloscope.

66. (New) A signal measurement system comprising:

a pulse management system configured to:

automatically generate at least one pulse measurement of a particular pulse measurement type for each of a plurality of pulses in a time-varying analog signal stored in an acquisition memory;

generate at least one measurement statistic for the particular pulse measurement type, wherein the at least one measurement statistic is generated using the generated pulse measurements of the particular pulse measurement type for at least some of the plurality of pulses; and

store the generated pulse measurement results and measurement statistics in a searchable data structure.